

FIRST ANNUAL REPORT
OF THE
MCKEAN & ELK LAND & IMPROVEMENT
COMPANY.

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1856

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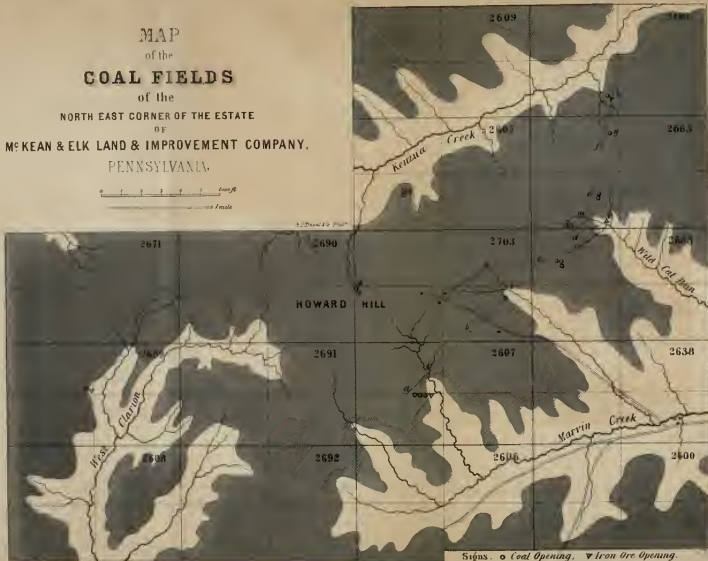




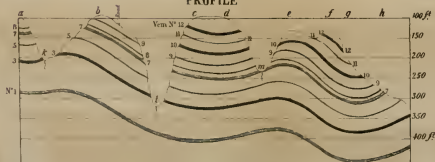




MAP
of the
COAL FIELDS
of the
NORTH EAST CORNER OF THE ESTATE
OF
McKEAN & ELK LAND & IMPROVEMENT COMPANY.
PENNSYLVANIA.



PROFILE



The lateral Scale is equal to that of the Map.

FIRST ANNUAL REPORT

OF THE

BOARD OF DIRECTORS

OF THE

McKean and Elk Land and Improvement
Company

TO THE

STOCKHOLDERS.

PHILADELPHIA:

E. C. & J. BIDDLE, No. 8 MINOR STREET.

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OFFICERS.

1857.

President.

JOHN C. CRESSON.

Directors.

JOHN C. CRESSON,
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FREDERICK FRALEY,
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JAMES R. GREEVES.

Secretary and Treasurer.

WILLIAM BIDDLE.

R E P O R T.

10-27-43
200.
In their introductory report, presented soon after the organization of the Company under its charter, the stockholders received from the Board a general description of their estate, derived chiefly from the statements of surveyors and engineers who had independently, and at different times, made such explorations as were practicable in a remote and uninhabited wilderness. These earlier researches were, of necessity, to a great extent, superficial, but were sufficiently comprehensive to prove the existence of large bodies of minerals, and fully satisfy the proprietors of the great value of their entire estate, leaving for further determination the questions of the exact locality of each mineral bed, and the points at which they might severally be opened for working to the greatest advantage.

So long as the property was to be held in its entirety and unimproved, a general knowledge of the actual existence of its hidden treasures sufficed; but, as the time approaches when, by the completion of several projected lines of railway, its products will find easy avenues to market, it becomes both the duty and the interest of the Company to make preparations for the lease or sale of portions of its lands to individuals or associations desiring to establish mines or manufactures.

For these purposes the more exact and definite geological determinations become indispensable.

The accomplishment of these, in a manner to secure reliable practical results, will require a full development of the various mineral strata at several suitable localities, in connection with accurate instrumental surveys covering a large extent of the territory owned by the Company, and is, therefore, a work of considerable time.

As, in the judgment of the Board of Directors, the period for beginning this important work had arrived, arrangements were made early last summer for placing it in charge of an engineer whose training to the exact determination of the difficult problems of practical geology and topography should entitle his recorded results to their entire confidence. The work was intrusted to Mr. Augustus F. Dalson, an engineer of mines, favorably known as possessing, in a high degree, the requisite qualifications, who, under instructions from the Board, commenced the survey in a district lying along the northeastern boundary of the estate, which was thus selected for the twofold reason that the geological structure in this extreme quarter was thought to be more doubtful than in many other parts, and that it will probably be earliest connected with avenues to the Northern market. After a brief season of operations in the field, which were much impeded in their commencement by the want of preliminary data, the engineer has presented, in a lucid report and drawings hereto annexed, his primary results of explorations, covering partially an area of about sixteen thousand acres.

A careful examination of these documents cannot fail

to convey an adequate idea of the vast importance of this complete mining exploration, if we advert to the fact that the large amount of minerals already developed by the survey is contained in the comparatively limited compass of about one-eighth part of the Company's estate.

Upon the completion of the survey, the fair value of each particular tract will be distinctly made known, and, thus guided, any one desiring to buy for mining purposes can make a judicious selection of such tracts as will be sure to fulfil his expectations of profitable investment.

It will also enable the Company to distinguish between tracts that are purely agricultural and those which, from the value of minerals entirely hidden from ordinary inspection, ought to be reserved, or, if sold to farming settlers, should have the mineral right reserved, and their surface only alienated.

The district just explored has already begun to attract the attention of parties seeking mineral lands, from some of whom proffers to negotiate have been received. Definite action for effecting sales has, however, been postponed until all parties interested, either as buyers or venders, should have a fair opportunity for obtaining full and reliable information respecting the mineral character of the lands now first made known officially by the publication of the report of our engineer.

Upon the return of the proper season for field-work the survey will be resumed, and extended to other parts of the estate.

In addition to the maps and drawings illustrative of

the local geology and topography, Mr. Dalson has prepared two other maps of a more general character, exhibiting some of the external relations of our lands.

One of them is designed to show the courses and connections of the various streams of water that take their rise within our boundaries or near them; and the other, to give a correct view of the natural routes to the several markets for coal and iron and timber, which, as may readily be seen by inspecting the map, can be reached by railroads of easy construction, most favorably adapted, by their descending grades, for the economical transportation of these heavy commodities.

One of these roads, designed to form an immediate connection with the New York and Erie Railroad, and to lead eventually, by a very direct route, to the city of Buffalo, is now in a state of forwardness, and is expected to be completed during the present year to a point within four miles of the northern boundary of the tract we have just surveyed.

By the completion of this railroad a direct communication will be opened between the great northern market bordering on the lakes and the coal-field of McKean County, inaugurating a commercial intercourse between these regions of demand and supply that will most surely be productive, at an early day, of the same rapid development of the value of mineral lands in this county as has invariably ensued when a new coal district has been first opened to an extensive market.

In conclusion, the Directors would express their great satisfaction in being able to present to the Stockholders, as the auspicious result of their brief corporate exist-

ence, such reliable evidence that the enterprise in which they are embarked already exhibits ample promise of the realization of their most sanguine expectations of profitable return.

By order of the Directors,

JOHN C. CRESSON,

President.

NOTE.—Since the presentation of this Report to the annual meeting of the Company, information has been received of the action of the Committee on Canals in the Senate of New York reporting unanimously in favor of a bill for extending the Genesee Valley Canal up the Alleghany River to the State line ; from which point a slack-water navigation is to be made to the county seat of McKean, by a company incorporated for the purpose by the Legislature of Pennsylvania. The completion of these improvements will bring a continuous water communication with the great lakes within a few miles of the lands of this Company, in a direction that can be reached by a cheap railroad of easy gradients in favor of the heavy traffic.

ENGINEER'S REPORT.

JOHN C. CRESSON, Esq.,

President of the McKean and Elk Land and Improvement Company.

DEAR SIR: I have the honor to present a preliminary Report of the explorations of parts of your estate in McKean and Elk Counties, Pa., in which I have been engaged from the beginning of July to the middle of November last.

This exploration consisted chiefly in a geological survey, which implies a variety of operations in the field; the account of it in detail must be preceded by some closet work which has not yet been completed. The following, therefore, besides a brief description of the country, contains only a general summary of the work that has been done, and the general results which have been established by it in respect to the deposits of valuable minerals in the region examined.

The lands of this estate, an area upwards of 130,000 acres, are situated within the northernmost coal-fields of Pennsylvania, and consist of a plateau 2000 ft. above tide-water, furrowed by a great number of streams which run towards every quarter of the compass. Many of these streams form deep valleys and ravines, thereby sensibly modifying the character of a plateau.

The streams nearly all are branches of the Alleghany River, and tributaries of these branches. The most

important among them are: The Kenzua and Tionesta, both with a westerly course, the Marvin Creek running East, and the Clarion, originating in two main branches and running southward. Only the southeast corner of the land is drained by tributaries of the Sinnemahoning River, a branch of the Susquehanna.

With the exception of a number of settlements on the Marvin Creek and along the road between Smethport and Ridgeway, the whole country in question is one continuous forest, bearing an inexhaustible supply of valuable timber. The trees are found in great variety: hemlock, beech, maple, poplar, oak, pine, cherry, cucumber and others, and frequently of that amazing size which bespeaks both a primitive forest and a fertile soil. While these species generally occur promiscuously in all parts of the land, some of them, indeed the most valuable ones, are found in groves with a perceptible exclusion of the others. This is the case with the pine, cherry, hemlock. The hemlock is abundant, and, fortunately for the mining operations that may be expected to begin here at an early day, this tree, which is to supply the propping timber, is met with along the watercourses in all parts of the lands. Pine is usually scarce; yet pine groves occur, especially in the southeastern part. To my own knowledge, the region between the upper branches of the north fork of West Creek, and corresponding branches of the East Clarion, especially in warrants 2591, 2323, 2487, may be properly designated as a pine country. Of cherry groves, apparently the most valuable among these woods, three have been pointed out to me, as covering each upwards of a thousand acres. One of these, be-

tween the Tionesta and West Clarion (in warrants 3121, 3127, and east of these), I had the opportunity of traversing during a geological excursion; it led me for more than a mile in length through groups of cherry-trees which appeared to rival each other in size, soundness and beauty. The value of the mere surface of the land in this quarter was, on their account, estimated at 100 dollars an acre even in the present market.

But if this wealth of timber stands there in open light to every visitor; the mineral treasures of the region are concealed not only in the deep shades of the forest, but also, as I shall have occasion to show more amply hereafter, by the geological structure itself.

The nature of this region, as a mineral country, has been vaguely known for about 25 years. Hunters and surveyors had frequently found fragments of coal and iron ore in the streamlets, and about the roots of wind-fallen trees. Yet scientific explorations up to the present year have been but few and superficial. With perhaps some insignificant exceptions, they were not sustained by real openings of strata, nor based on instrumental measurements; their results, therefore, for the greatest part, require yet revision and definition. Such was the case also within the boundaries of your estate, and especially in its northern parts. The presence of coal and iron was an undoubted supposition or a vague fact, but no opinion could be formed concerning the number and nature of their beds.

When, therefore, your Company, to induce settlement and enterprise on these lands, decided to actually develop its minerals, it became a necessity to begin the work with a geological survey.

The region drained by waters of the Marvin Creek (about 10,000 acres of land), and some 6000 acres of the country adjoining it, were selected to begin with, since in this region there is an early prospect of communication with the coal market, especially the great Lakes and cities of the North.

Here, therefore, on Howard Hill as a central station, I began my survey. The object with it was not only to ascertain the exact geological and topographical structure of this part of the estate, which is equivalent to a determination of the extent, number, and nature of its iron ore and coal-beds, but also to procure from positive and combined data a clue to the mineral deposits in the rest of the lands.

Exposition of strata by means of digging, opening of coal-veins by means of shafts which were sunk to a depth of 6 or 8 to 18 and even 20 feet through the alluvial gravel and loose stones, which in this region so regularly cover the outcrops, that scarcely one instance of natural exposure of rocks in their primitive place is met with—these diggings formed a prominent part of the work. What they revealed was located and combined by a topographical survey, while the distribution of shafts, in its turn, was regulated by the gradual progress of the whole work. The difficulty of a first and real development of the country in question, and likewise the pains taken to obtain positive information, may be partly inferred from the fact that upwards of 60 shafts were dug of which about two-thirds expose either the outcrop of some coal vein or the coal smut leading to a vein. Only few of the shafts were made for the

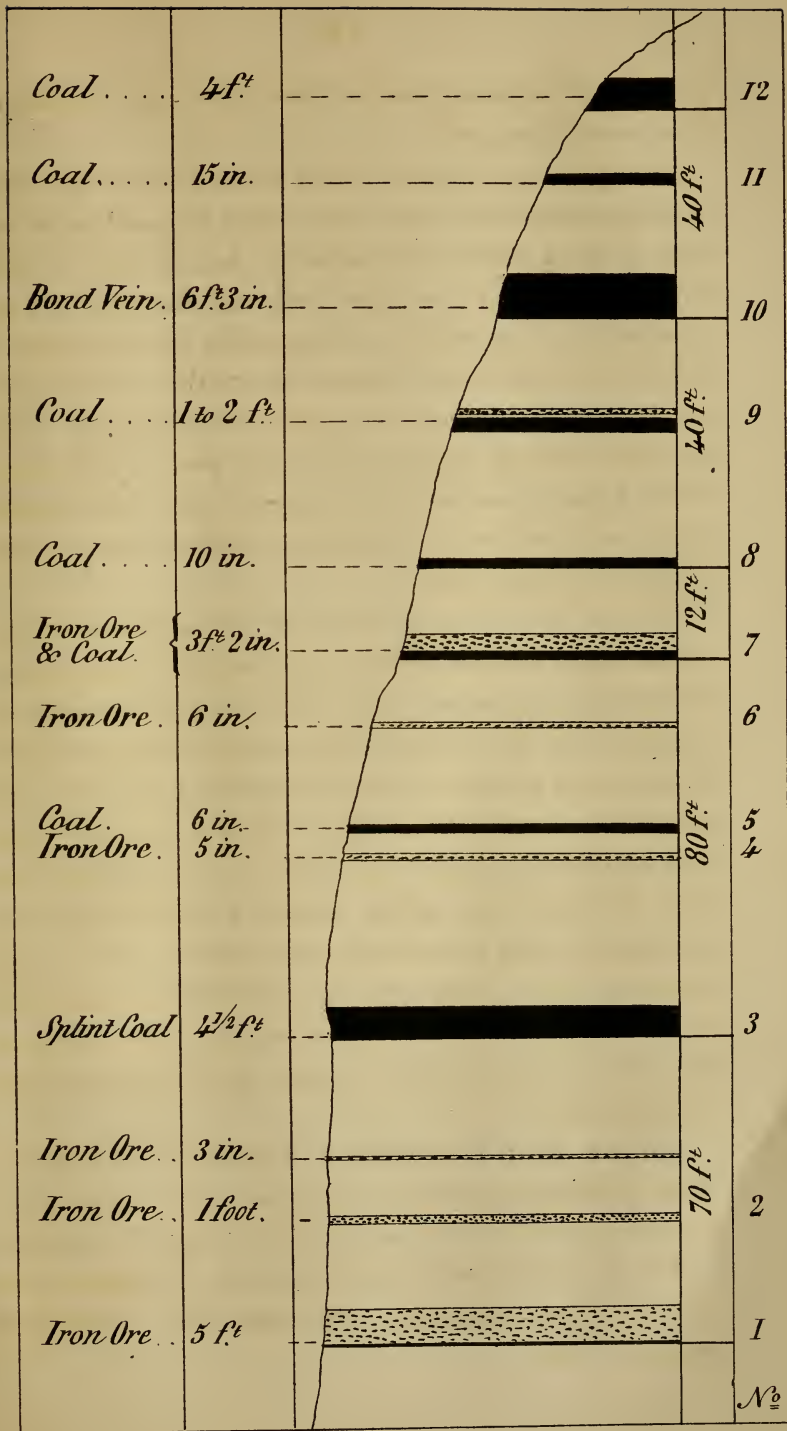
purpose of opening beds of iron ore; yet several of these were discovered.

As a prominent result of this work, the fact was conclusively established that the region in question is not only situated within the coal-fields, but is itself a coal land proper; for bituminous coal and the iron ores accompanying it, pervade it so regularly as to be missed only in the valleys and ravines, where the streams have cut through the strata and produced denudation. And this same remark applies to all other parts of the estate which I had opportunity to examine, viz: those to the south and southwest of Howard Hill, so far as Iron Creek and Rocky Run.

Within the compact body of 16 warrants in the northeastern corner of the estate, which I have more particularly examined, and which I shall proceed to designate as the Howard Hill section, 8 distinct veins of coal were found, of which, however, 4 appear to be too thin for profitable mining. Of iron beds 3 or 4 appear as regular veins. But with the exception of one of 2 feet thickness which makes a workable vein in conjunction with a coal-vein, with which it lies in immediate contact, they must be considered insignificant in comparison with one bed of iron ore, the lowest in the strata, which has been opened and measures 5 feet in thickness.

I annex here a diagram to represent the different strata of coal and iron ore in a place where their number is the greatest found within the Howard Hill section.

Nos. 1, 2, 4, 6, are beds of iron ore; No. 7, a vein of coal and iron conjointly. Of these Nos. 1 and 7 are workable beds.



The ores in all of these veins, although somewhat varying in quality, all belong to the regular carboniferous iron ores, of which the type representative is a nodule or ball of argillaceous carbonate of iron coated with a crust or shell of brown hematite. It is the principal ore worked in England, and produces from 30 to 40 per cent. of iron of good quality. Average specimens of ore from beds No. 1 and No. 7 have been taken for the purpose of analysis.

No. 3 is the lowest coal vein. This bed has been drifted into, to some extent near Lafayette (to the south of Marsh's corners), and proves to consist of coal of a superior quality, viz., the so-called splint coal, which is particularly adapted to the use of steam-boilers. It being the lowest coal-bed in the whole series, and therefore most likely to be found throughout your estate, the limits of time and labor induced me to delay the prosecution of its opening until more uncertain questions, viz., those in regard to the extent of the upper coal-veins Nos. 10 and 12 were settled. In two places, however, viz., on a southern branch of the Marvin, and on the West Clarion (in warrants 2607 and 2689), this vein was sufficiently opened to demonstrate beyond doubt its identity with the splint vein of Lafayette. A drift into it on the Marvin Creek near the road to Howard Hill, has been recently started and is now under operation.

Nos. 5, 7, 8 and 11, although partly consisting of good bituminous coal, are of too small thickness to merit any attention.

In No. 7, the conjoint iron ore and coal-vein, the coal is bituminous and pure, and the iron ore overlies it in as good as immediate contact, for only a streak of slate

from 1 to 2 inches thick separates them. This circumstance evidently will facilitate the mining of both benches, while owing to their limited thickness they would otherwise be considered unproductive. This vein has been proved in several places during my survey. A well-preserved shaft upon it may be seen about three-quarters of a mile westward from the settlements of Howard Hill.

No. 10 is a coal-vein which has been opened in different localities of the region, and is named the Bond Vein owing to a drift into it on the property of Mr. Bond, north of the KENZUA River. Within the Howard Hill Section it has been opened in 4 shafts, on branches of the Wild Cat Run, in warrants 2663 and 2665. It appears to vary in thickness from $5\frac{1}{2}$ to $6\frac{1}{2}$ feet. Owing to a parting of slate in the middle of the vein, its quantity of pure coal is reduced to 5 feet, and locally perhaps to $4\frac{1}{2}$ feet. But the presence of this unprofitable bench of slate is compensated by a bench of cannel coal, which is found in variable thickness (apparently from 6 inches to 1 ft. 6 inches), in the upper part of the vein.

No. 12 is a vein of 4 feet thickness, and consists of pure bituminous coal throughout, with the single exception of a streak (1-2 inches) of so-called gut or undermining, a soft slate desired by the miners as facilitating their work.

Consequently out of these 12 mineral beds of our general section, 5 must be considered productive and profitable, viz: Nos. 1, 3, 7, 10 and 12. The three lowest among these are supposed to extend throughout the whole section examined, the valleys and ravines excepted. The beds Nos. 10 and 12 are confined to

narrower limits, especially in this northeastern quarter, where they have been preserved only within the warrants 2703, 2663, 2605 and 2665.

While in a profound sense of my responsibility I postpone the more exact estimate of these considerable deposits until the plottings of field notes and the construction of plans and sections have been completed, it may be proper to state that Howard Hill cannot be expected to represent a fair average of the mineral deposits in your lands. For it so happens that the elevated ground in the centre of this section is formed by an anticlinal axis of the gently undulating strata, which raises the lower coal measures up to the very summit of the ridge. Both northward and southward from this ridge, the strata fall off or dip so as soon to admit the upper measures even into hills of lower level than the Howard Hill Summit. This peculiarity of geological structure accounts for the presence of coal-veins Nos. 10 and 12 towards the northeastern corner of this section, the presence of one additional coal-bed at Lafayette, which overlies even No. 12 of the General Profile, and the many promising signs of good coal-veins that are found in the more southern parts of the estate.

The level of the country at the head of Johnson's Run was determined by a careful transit line of elevations and inclinations, and found about 300 feet lower than the summit of Howard Hill; and yet in that very locality, viz: about the springs of Johnson's Run, several coal-beds have been discovered which apparently belong to the uppermost measures of the whole region. Even the stratum of upper limestone, for which *all* parts of the Howard Hill section are (geologically) too low, is

found here, and may be seen at the limekiln near the road to Livezey.

With such indications, and in view of the general fact that the great bituminous coal-fields of Pennsylvania, of which this region is an appendix, lie in a southerly and southwesterly direction from Howard Hill, the inference seems justified that in all the high grounds in the southern and southwestern parts of your estate the coal-beds are most likely to be found superior to those of Howard Hill in regard both to number and thickness. For, this coal basin vanishing entirely only a few miles north of the Kenzua, or at a point short of the State line of Pennsylvania, it is probable that it does so not abruptly, but gradually, which is tantamount to an increase of measures southward.

It is my duty to remark that notwithstanding the considerable work and expense that have been bestowed on the Howard Hill section of your estate, I cannot consider the research here as absolutely completed. In a country like this, where every effective step of progress must be prepared by expensive and slow labor, a work of 4 months should not be considered a maximum. In the lower strata of the general profile of the McKean County coal region, there is found a bed of limestone, which is valuable especially for agricultural and iron making purposes. To judge from appearances, this stratum may yet be high enough in the measures to crop out in the Wild Cat Valley, within the boundary line of your estate, and a special research, which I found no opportunity to accomplish, may discover and expose it. At Lafayette, only a few days previous to my departure from McKean County, a superior iron ore, the

so-called Blackband, was discovered by Prof. Owen. The general identity of the geological strata on both sides of the Kenzua River, renders it entirely natural to suppose that this valuable mineral, on further research, will be found also on the south side and within your lands. Its discovery in McKean County was unlooked for, and at the time when it became known, more immediate duties engrossed the short remainder of my time for field work, so as to make a revision of the diggings at Howard Hill impossible for the season.

In regard to the communication of the coal-fields of McKean County with the great coal market on all sides, your own report to the stockholders of your Company (March, 1856) contains so ample information, that it is necessary here only to mention a word about the facility of mining the coal and its transportation out of the coal district itself.

The nearly horizontal and yet gently rolling strata, together with the fact that the coal veins usually lie above the water level of the streams, make it possible to locate collieries almost in any part of the lands, and without need of artificial drainage in the mines. And as the waters of the latter will be carried off by gravity alone, so will the coal be transported by the same agency from the mouths of the drifts to the railroads located in the main valleys. Thus, in the Howard Hill section, the coal from the springs of Wild Cat Run will pass by descending roads on the hill-side, to points near the mouth of that stream, and thence down to the bottom of the Marvin Valley. In this valley a nearly straight railroad of gentle descent (by estimate about 30 ft. to a mile) will carry it down to the junction with

Nununda at Smethport, or the head of the canal navigation northward. The same arrangement will occur on the more western branches of the Marvin.

The high ridge which winds through the Howard Hill section from northeast to southwest, past the springs of West Clarion, and then outside of this section turning more southward, the whole of this ridge may, besides the above route, obtain a communication with the State of New York by means of a railroad around the Kenzua River, connecting with the Tunanguant road to Buffalo, which is now being constructed.

The general situation of your estate and its relation to the surrounding country, especially the routes to the coal market on the north side, will be seen from the maps accompanying this report.

Very respectfully,

your obedient servant,

AUG. F. DALSON,

Engineer.

PHILADELPHIA, Dec. 6, 1856.

GENERAL DESCRIPTION

OF THE

MAP AND SECTIONS BELONGING TO THE GEOLOGICAL SURVEY OF THE
HOWARD HILL REGION OF THE ESTATE OF THE M'KEAN
AND ELK LAND AND IMPROVEMENT COMPANY.

By AUG. F. DALSON, Engineer, 1856-57.

THE Howard Hill Region to which these drafts refer, forms the northeast corner of the estate, and contains in 16 warrants about 16,800 acres of land.

Draft No. 1 is a Geological Map designed to exhibit, besides the topography, the approximate extent and position of the important beds of coal and iron ore.

These, as I have already stated in my preliminary report (Dec. 1856), are the following, beginning at the lowest in the strata ; compare the general cross sections on drafts Nos. 2 and 4:—

No. 1. Veins of nodular iron ore.

No. 3. The splint coal vein.

No. 7. The lower twin vein containing coal and iron ore conjointly.

No. 10. The bond vein.

No. 12. The 4 feet coal vein.

The extent of any continuous vein depends upon its height in the geological series, its dip, and on the topo-

graphical configuration of the ground. This circumstance demanded an accurate instrumental determination of the latter in those elevated parts which were likely to contain the upper strata. Accordingly, the central and northeastern parts of the map south of the Kenzua River, rest on actual survey, as also the dividing ridge between the waters of Toby Creek and the Kenzua, extending from Howard Hill to the southwest corner. With regard to the rest of the map the topographical data result principally from a retracing of warrant and subdivision lines, the only defined landmarks that could be made available in this unsettled country. Incidental notes and general observation have also been applied.

A reference to the general sections on draft No. 2 will show that the curved lines on the map represent the outcrops of the several veins; those marked in black, purple, and pink, belong to the coal veins, and those in red to the veins of iron ore.

These veins have been opened in several places, and to them suitable references will be found at the foot of the map. The openings occur principally in 5 groups, viz., 1. North of Howard Hill on the slope of the Kenzua; 2. South of the same place on a branch of the Marvin Creek; 3. In three places on the Daguscahonda; 4. North of the latter on the Kenzua, and finally, 5. On Toby Creek. The most remarkable openings I shall describe when considering the sections.

The heights of the hill-tops and other points, referred to a standard level (this is marked on the map at Howard Hill as 100 feet), are derived from actual levellings by which the different coal openings were connected.

They are shown by figures written in their respective places.

These levellings were the principal guide in determining the dips of the veins; for the local dips, as exposed in the shafts, proved to be an uncertain criterion, owing to the constant disturbance of the outcrop; the more so, as the true dip in these coal-fields is, in general, gentle and often variable.

The variation of the dip, as exhibited in the cross sections on draft No. 2, is the result of a careful comparison of the level notes and geological data.

In my preliminary report I have described the structure of Howard Hill, and intimated that it forms an anticlinal axis having a general easterly and westerly direction. The sections on draft No. 2 correspond with this view; for it will be seen that the highest point of the veins occurs in that vicinity. It is also sustained by a reference to the map.

The opening of the lower twin vein, west of Howard Hill (No. 7 on the map), is 153 feet higher than the opening of the same vein on the Kenzua cross section, 1 mile northward.

Towards the northeast, upon the springs of the Daguscahonda, the veins No. 10 and 12 are found at levels lower than vein No. 7 near Howard Hill.

The splint vein likewise, whose place is about 80 feet below the lower twin, is at the height of 215 at the place last mentioned. Yet the opening (No. 3) of this vein on Toby Creek proves it to be at 318, or 103 feet lower in that vicinity.

Having taken a view of the geological map and its connection with the general cross sections, it will be

proper to refer more particularly to the section exhibiting the entire stratification, and to the other sections on drafts Nos. 3 and 4.

The entire stratification contains 8 beds of coal and 7 of iron ore. Of these only the 5 above mentioned appear to be practically important, at least in this part of the estate. These beds are interstratified with sandstones and shales, of which the former predominate in the upper strata. The shales, owing to their friable nature, are rarely found in loose fragments upon the surface, or along the watercourses. With the sandstones, including the conglomerates, the contrary is the case, and some of them are sufficiently characteristic to serve as valuable guides in surface examinations, as well as in the identification of the veins. As such, may be specially mentioned the coarse soft sandstone marked with pink color on the drafts, and also the upper conglomerate. The latter appears to be only locally developed in this region, yet in some instances occurs in huge naked blocks on the brow of the hills. The lower conglomerate underlies all the valuable mineral beds with the exception of a fossiliferous limestone which occurs locally below it. On account of its position below the coals and iron ores, this limestone remained beyond the limits of my exploration; it is not, however, unlikely that it may be found in the deep valleys, especially on the Daguscahonda.

An actual cross section obtained by a series of shafts on the slope of the Kenzua, is represented on draft No. 3. This section, which was a work of some extent, undertaken in the beginning of the survey, afforded the first clue to the geological details of the region. It will

be useful in any further explorations on the estate; for, notwithstanding some local variations which are apt to occur in single strata, a whole series of them must be assumed to preserve its general character throughout these coal-fields. The sandstones of this section present considerable variety of appearance and structure, which could not readily be delineated on the draft. These characteristics can only be learned by a study of the rocks themselves. A supply of specimens has been preserved.

The diagrams L, M, N, P, and Q, on drafts Nos. 3 and 4, are sections of the most important coal openings, and show in detail the nature of the several veins.

Four different shafts on the bond vein have disclosed a variation in its benches. L and M represent two extreme cases. It will be noticed that in M the bench of cannel coal, which is a usual feature of this vein, is not indicated, because only a trace of it was found in this shaft, whilst in all the other openings it was present. It is further worthy of notice that the slate and clay shown in L, appear in M in the form of two separate benches of slate, leaving three distinct benches of pure coal, whose aggregate thickness is $5\frac{1}{2}$ feet. Considering this change in the vein, I estimate its average thickness of coal at not less than 5 feet.

N represents an opening of the splint vein on Toby Creek. When the vein was first reached, it appeared thin and irregular, but improved rapidly as the excavation was continued for a short distance towards the hill. It was evident that the true nature of the vein had not been ascertained when the work was interrupted by the approach of winter. Some clay is observable, which is

probably not continuous, but results from the disintegration of slate; this appearance is not unusual near the outcrops where there is little protection against percolation from the surface.

Two more diagrams, P and Q (draft No. 4), are presented to exhibit in detail the characteristics of veins Nos. 7 and 12. Owing to the influx of water, it was necessary here, as in some other instances, to make open cuts instead of shafts. Appearances do not indicate that these beds would increase materially in thickness if pursued further under cover than is here represented; the excavation of vein No. 12 especially was continued as long as there was a reasonable prospect of increased thickness.

The map indicates that several openings have been made upon the coal, of which no section has been presented. They have served principally to determine the position and identity of the veins, and require no further notice.

Some openings of iron ore are also shown on the map. Besides the 2 feet ore opened with the coal in No. 7, diagram P, there is but one bed of importance. This is the vein No. 1, which has been exposed at the fork of the two westernmost branches of the Daguscahonda. It was reached at the foot of a steep hill, under a strong cover, and immediately exhibited a uniform bed of nodular iron ore, 5 feet in thickness. It requires no special illustration.

It seems unnecessary to extend the description of the map and drawings, since I have endeavored to record upon them most of the details which are needed to amplify my preliminary report. I shall now present an

estimate of the total amount of the mineral deposits within the 16 warrants comprised in the map.

ESTIMATE.

No. of Vein.	Thickness.	Area in acres.	QUANTITY IN CUBIC YARDS.	
			Coal.	Iron ore.
1	5 ft.	13,320	—	107,000,000
3	4 ft.	11,890	76,000,000	—
	14 in.		9,975,000	—
7	2 ft.	5,300	—	17,000,000
10	5 ft.	7,000	5,600,000	—
12	4 ft.	210	1,350,000	—
Total	.	.	92,925,000	124,000,000

A cubic yard of coal is generally estimated at 1 ton. Estimating only the same weight for every cubic yard of iron ore, a large allowance will be made for any foreign substance that accompanies the nodules, and thus the tonnage will be found by adopting the above totals of the cubic yards. I beg to observe that in this estimate the vein No. 10 on the north side of the Kenzua River has not been taken into consideration. Owing to its elevated position in the strata, the occurrence of this vein is decidedly local, and its supposed presence in the locality mentioned has not yet been proved. On the other hand, the veins No. 1 (opened on the Daguscahonda) and No. 3 (opened on the Toby Creek), which, in consequence of their geological situation, have but slightly been removed by denudation, have been assumed to extend throughout with a uniform thickness of respectively 5 and 4 feet. It is true that openings of these veins, which exhibit dimensions like the above, have been

made outside of your estate, viz., near Marsh's Corners, and even so far as Cole Brook. Yet a *uniform* thickness for a distance of five or more consecutive miles, as the above implies, I consider improbable, and continued explorations may cause the figures here obtained to be more or less modified. It is obvious, however, from the nature of the question, that an *à priori* estimate in figures will ever remain only a vague approximation.

In regard to the quality of the coals and iron ores I have already expressed a general opinion, and for particulars refer to the analyses for which specimens have been forwarded.

AUG. F. DALSON.

JANUARY, 1857.

A N A C T

TO INCORPORATE THE McKEAN AND ELK LAND AND IMPROVEMENT COMPANY.

WHEREAS, Samuel M. Leiper died seized of an undivided fourth part of a large body of unimproved lands in the Counties of Elk and McKean, in this Commonwealth, and entitled to receive a fourth part of the proceeds of a sale of said lands under an executory agreement, which, by reason of the failure of the contracting parties to pay, was afterwards rescinded:

AND WHEREAS, The other owners of said lands are desirous of converting their respective interests therein into the Capital Stock of a Coporation hereby established:

AND WHEREAS, The interests of the widow and heirs of the said Samuel M. Leiper would be greatly injured by the sale of said lands under proceedings in partition which are now threatened by the other owners, and inasmuch as the executors of the said Samuel M. Leiper have no authority in law to convey the same to the said corporation, and receive, as the other owners are about to do, payment in the Stock of said Corporation, therefore—

SECTION 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania

in General Assembly met, and it is hereby enacted by the authority of the same, That William A. Irvine, trustee of Samuel M. Leiper, or John K. Kane, and others, executors of the said Samuel M. Leiper, be, and they are hereby authorized to sell and convey by good and sufficient deeds in fee simple or otherwise, to the Company hereinafter incorporated, all their said undivided interest and estate, whether it be personal or real, which he, the said Samuel M. Leiper, held in his lifetime to the said lands, or which they now hold, and to receive in payment therefor the stock of said Corporation, and to sell said stock, or any part thereof, and convert the proceeds thereof into other securities at their discretion: *Provided*, That the same shall be held by them in the same manner and for the same purposes and trusts as the said lands or their interests therein are now held.

SECTION 2. That Henry M. Watts, John K. Kane, Frederick Fraley, John C. Cresson, Samuel Mason, John Livezey, Joseph Cresson, Jeremiah Hacker, Mordecai L. Dawson, Samuel Welsh, James R. Greeves, J. Pemberton Hutchinson, William Biddle, Thomas Struthers, and the executors of Samuel M. Leiper, deceased, and their associates, successors, and assigns, be, and they are hereby constituted a body politic and corporate, under the name, style, and title of the McKean and Elk Land and Improvement Company, by which name the said corporators shall have perpetual succession, and enjoy all the privileges, incidents, and franchises usually pertaining to a Corporation, and not inconsistent with the powers and duties hereinafter set forth.

SECTION 3. That the above-named persons, or such of them as shall by signature accept this Charter, shall

meet as soon as convenient, after the passage of this act, and after giving reasonable notice of the time and place of a future meeting for the purpose of considering the provisions of this act, and in case of the acceptance of the same, shall proceed to elect by ballot seven of their number to serve as directors for the term of one year thereafter, and until their successors shall be duly elected, and annually thereafter, at such time and place as shall be appointed by the Directors, to serve for one year, and until their successors shall be duly elected; and each share of Stock shall entitle the holder thereof to one vote. The Directors so chosen shall elect one of their number as President of the Corporation, and all other officers and agents of the Corporation shall be elected and appointed as shall be prescribed by the By-Laws. Upon notice of the acceptance of the provisions of this act, and of the due organization of the Corporation, to the Governor of this Commonwealth, there shall be granted, in the usual form prescribed by law, letters patent to said corporators.

SECTION 4. That it shall be lawful for the said Corporation to have and to hold all the lands now owned and in possession of the said corporators herein named, who shall accept this Charter, in the counties of McKean and Elk, in this Commonwealth, and the same to value and convert into a common stock, which shall forthwith be divided into a convenient number of shares, so as to apportion the same among the aforesaid owners according to their respective interests in the said lands, and for which shares certificates of Stock shall be issued to each of them, signed by the President, with the corporate seal thereto affixed, and attested by the Treasurer;

such certificates shall be issued and made transferable as the Directors may prescribe by their By-Laws, and the shares of Stock so created shall for all purposes be deemed and treated as personal estate.

SECTION 5. That it shall be the duty of the Directors to grant, bargain, and sell the said lands in such quantities and at such prices as may be agreed upon betwixt them and any purchaser or purchasers thereof, and to receive any moneys, mortgages, or other securities, including the certificates of Stock of this Corporation, in payment of the same, and to cause the President to sign and affix the corporate seal, attested by the Treasurer, to any covenant, deed, or other assurance, necessary in law for granting title to the same, as often as all or any portion of said lands are sold or otherwise disposed of: *Provided*, That the said Corporation shall sell and dispose of at least one-half of all their lands within ten years, and the remainder, except two thousand acres thereof, within twenty years from the date hereof.

SECTION 6. That it shall be lawful for the said Corporation to demise and let for a period or periods, together not exceeding twenty years, to such person or persons as may apply for the same, and upon such terms as may be agreed upon, any of the said lands, and the right and privilege of mining, taking, and carrying away the iron ore, coal, and other minerals and materials, from the said lands; and to aid in the development of the minerals and other materials, the use and transportation of them to market, and to promote the clearing and settlement of the country, it shall be lawful for the said Corporation to employ their capital in constructing such railways, not exceeding twenty miles in length, as may

be necessary from such mines to intersect the Sunbury and Erie Railroad, or the Alleghany Valley Railroad, subject, nevertheless, to the general law relating to the construction of railroads. The said Company is hereby authorized to create a Capital Stock of one hundred thousand dollars for the purposes specified in this section, and shall pay to the Commonwealth a tax of one-half of one per centum on said amount in four equal annual instalments, the first instalment to be paid in one year from the date of the organization of the Company.

SECTION 7. That all moneys, mortgages, and other securities for the payment of money shall be paid and delivered to the Treasurer, who shall have the custody of the same, and keep an accurate account thereof in such book or books as may be provided for the purpose, he giving such security for the faithful performance of his duties as may be required by the By-Laws. Dividends of the proceeds of sales of lands and other moneys shall be made among the shareholders as often as it shall seem advisable to the Directors, and at least once in every year; and when the proceeds of the sale of lands are paid to the holders of certificates of Stock, such certificates of Stock shall be surrendered to the said Corporation and cancelled, and new certificates issued according to a uniform rule of equitable adjustment of the rights of the Shareholders, to be established by the By-Laws, so that whenever the whole of said lands shall have been sold the certificates representing the same shall have been entirely exhausted and cancelled.

SECTION 8. That it shall be lawful for the said Directors, or a majority of them, and of whom a majority

shall constitute a quorum, to adopt a common seal, with appropriate device, for the use of said Corporation, and the certificates of Stock and other official acts of the Corporation shall be authenticated by affixing the same, and to enact such By-Laws and regulations as may be expedient for conducting and regulating the affairs of said Corporation: *Provided*, That the same shall not be inconsistent with the Constitution and laws of this Commonwealth.

SECTION 9. That the Legislature reserves the right to amend or repeal this act if the same shall hereafter be considered incompatible with the general good of the Commonwealth, but in such wise, nevertheless, as to do no injustice to stockholders, purchasers, and lessees of the said lands.

RICHARDSON L. WRIGHT,
Speaker of the House of Representatives.

WM. M. PIATT,
Speaker of the Senate.

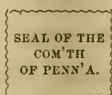
APPROVED, the sixth day of February, one thousand eight hundred and fifty-six.

JAMES POLLOCK.

LETTERS PATENT.

Pennsylvania, ss:

JAS. POLLOCK.



In the name and by the authority of the Commonwealth of Pennsylvania, James Pollock, Governor of the said Commonwealth,

To all to whom these presents shall come, sends greeting:—

WHEREAS, By the second and third sections of an act entitled "An Act to incorporate the McKean and Elk Land and Improvement Company," approved the sixth day of February, A. D. one thousand eight hundred and fifty-six, it is enacted and provided as follows, to wit:—

"SECTION 2. That Henry M. Watts, John K. Kane, Frederick Fraley, John C. Cresson, Samuel Mason, John Livezey, Joseph Cresson, Jeremiah Hacker, Mordecai L. Dawson, Samuel Welsh, James R. Greeves, J. Pemberton Hutchinson, William Biddle, Thomas Struthers, and the Executors of Samuel M. Leiper, deceased, and their associates, successors, and assigns, be and they are hereby constituted a body politic and corporate under the name, style, and title of 'The McKean and Elk Land and Improvement Company,' by which name the said Corporators shall have perpetual succession and enjoy all the privileges incident and franchises usually

pertaining to a Corporation and not inconsistent with the powers and duties hereinafter set forth."

"SECTION 3. That the above-named persons, or such of them as shall by signature accept the Charter, shall meet as soon as convenient after the passage of this act, and, after giving reasonable notice of the time and place of a future meeting for the purpose of considering the provisions of this act, and in case of the acceptance of the same, shall proceed to elect by ballot seven of their number to serve as Directors, for the term of one year thereafter, and until their successors shall be duly elected, and annually thereafter at such time and place as shall be appointed by the Directors, to serve for one year, and until their successors shall be duly elected, and each share of stock shall entitle the holder thereof to one vote. The Directors so chosen shall elect one of their number as President of the Corporation, and all other officers and agents of the Corporation shall be elected and appointed as shall be prescribed by the By-Laws. Upon notice of the acceptance of the provisions of this act, and of the due organization of the Corporation to the Governor of this Commonwealth, there shall be granted in the usual form prescribed by law, Letters Patent to said Corporators."

Now know ye, That I, James Pollock, Governor of the said Commonwealth, do therefore issue these Presents, which I have caused to be made patent and sealed with the great seal of the State, certifying that the said Company has complied with the requisitions and provisions of the above recited Act of the General Assembly of this Commonwealth, and has become a Corporation by virtue of the same, by the name, style, and title

of "THE MCKEAN AND ELK LAND AND IMPROVEMENT COMPANY," subject to all the duties, requisitions, and restrictions specified and enjoined in and by the said Act of the General Assembly, and all other laws of this Commonwealth.

Given under my hand, and the great seal of the State, at Harrisburg, this twenty-third day of February, in the year of our Lord one thousand eight hundred and fifty-six, and of the Commonwealth the eightieth.

By the Governor:

(Signed)

A. G. CURTIN,
Sec'y of the Commonwealth.

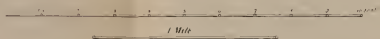
THE BOARD will shortly be prepared to make sales of lands to settlers or mining companies; for which purpose applications will be received by William Biddle, Secretary, at the office of the Company, Franklin Institute, Philadelphia; or by Thomas Struthers, Esq., agent at Warren, Warren County, Pennsylvania.



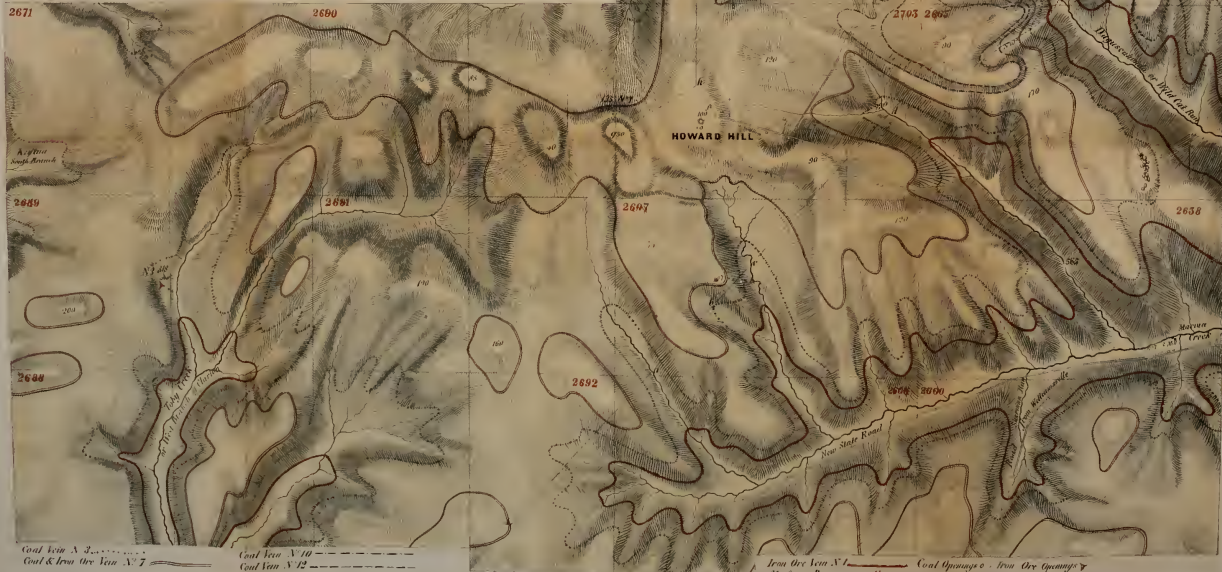
GEOLOGICAL MAP
of the
HOWARD HILL REGION,
of the ESTATE of the
M'KEAN & ELK LAND & IMPROVEMENT COMPANY,

PENNSYLVANIA.
From a Survey in 1856 by

AUG. F. DALSON,
Engineer.



Look at PS Barred Plot



Coal Vein A T.
Coal & Iron Ore Vein N 7

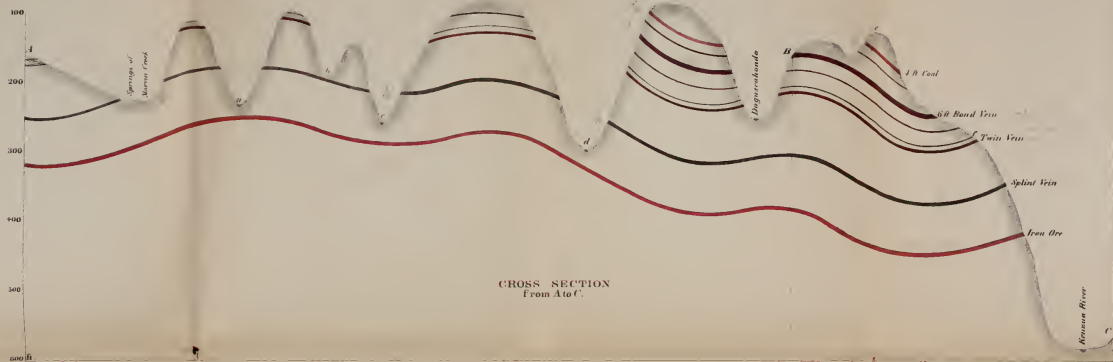
Coal Vein N 10
Coal Vein N 12

Iron Ore Vein N 1
Coal Vein N 11
Shale or Breccia ...
Gravel ...
Low point of Levels 1000

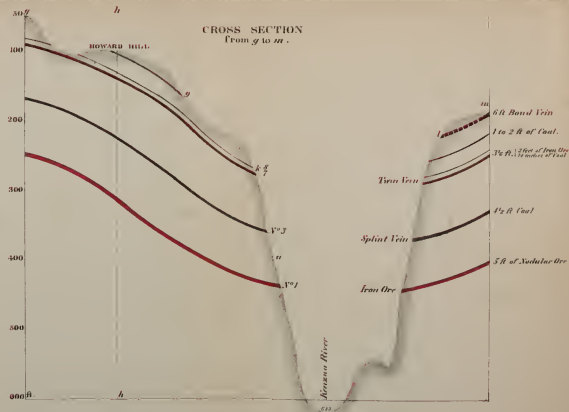
n. lith. Philad^a

GEOLOGICAL CROSS SECTIONS

in the Howard Hill Region of the Estate of the
MR KEAY & ELK LAND & IMPROVEMENT CO

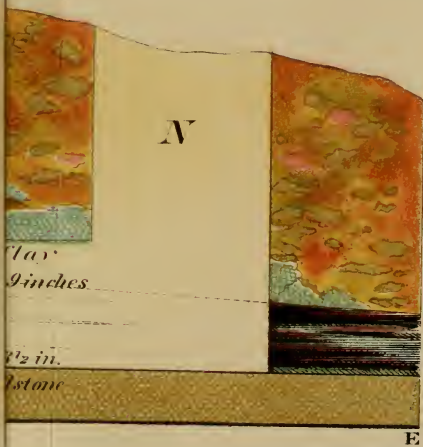


CROSS SECTION
From g to m.



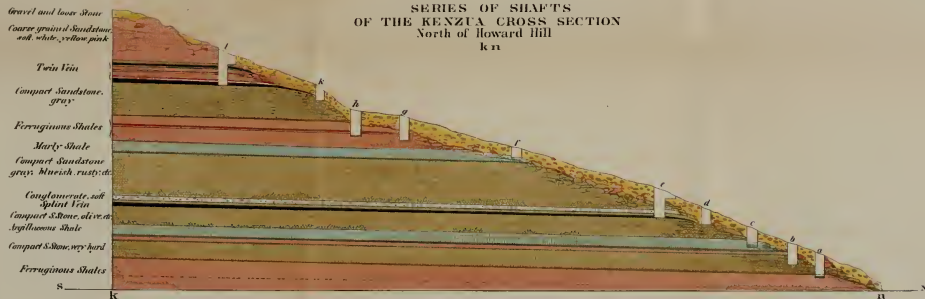
Lateral Scale equal to that of the Geol. Map
i.e. 2000 FEET TO 1 INCH.

OF THE SPLINT VEIN
 OBY CREEK
 No 3^a on the Map.

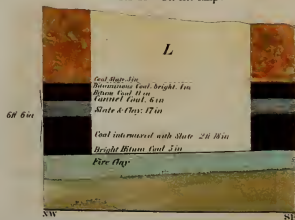


SHAFTS & COAL OPENINGS.

SERIES OF SHAFTS
OF THE KENZUA CROSS SECTION
North of Howard Hill
k 11



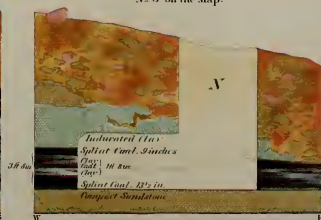
OPENING OF THE BOND VEIN
DAGUSCAHOXA
No 10^a on the Map.



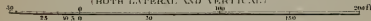
OPENING OF THE BOND VEIN
No 10^b on the Map.



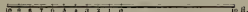
OPENING OF THE SPLINT VEIN
TOBY CREEK
No 3^a on the Map.



SCALE OF THE KENZUA CROSS SECTION
BOTH HORIZONTAL AND VERTICAL.

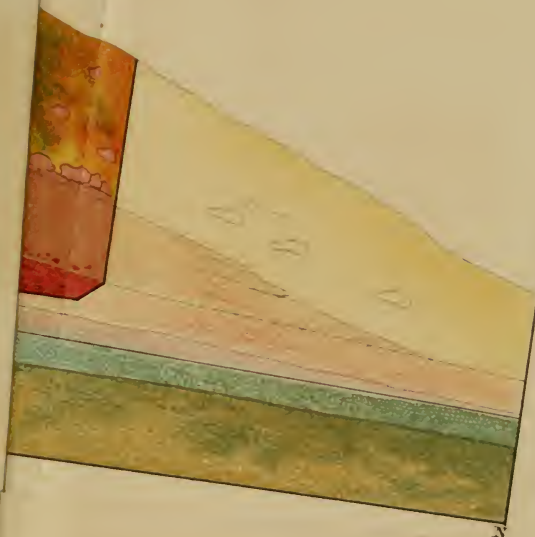


SCALE OF THE DIAGRAMS, L, M & N



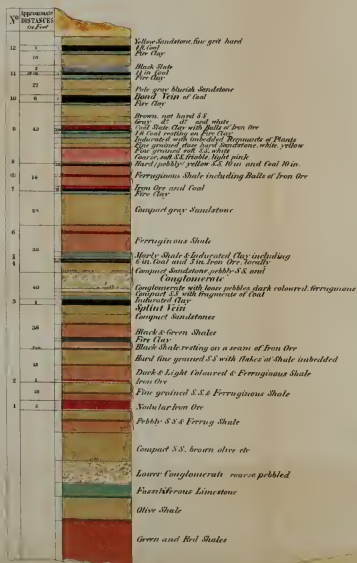
THE LOWER TWIN VEIN

rd Hill, N^o 7 on the Map.

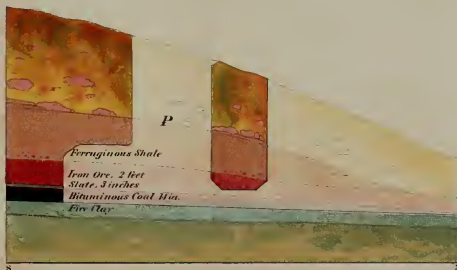


THE LOWER TWIN VEIN
rd Hill, N^o 7 on the Map.

THE ENTIRE STRATIFICATION From various Data.



OPENING OF THE LOWER TWIN VEIN West of Howard Hill, No 7 on the Map.



OPENING OF THE 4 FEET VEIN No 12 on the Map.



SCALE OF DIAGRAMS P & Q
10 5 0 5 10 ft.

